



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,723	07/30/2004	Robert J. Mills	03130.0012.PCUS00	4286

7590 10/24/2006  
Harbin King & Klima  
500 Ninth Street SE  
Washington, DC 20003

EXAMINER
----------

NGUYEN, NINH H

ART UNIT	PAPER NUMBER
----------	--------------

3745

DATE MAILED: 10/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/710,723

Applicant(s)

MILLS ET AL.

Examiner

Ninh H. Nguyen

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 53-70 is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☒ Claim(s) See Continuation Sheet is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 08/09/06.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_.

Continuation of Disposition of Claims:

Claims rejected are 1-3, 4/1-4/3, 5/1-5/3, 8/1-8/3, 9/1-9/3, 10/1-10/3, 11/1-11/3, 12/1-12/3, 13/1-13/3, 39/1-39/3, 40/39/1-40/39/3, 41/39/1-41/39/3, 43-39/1-43/39/3, 44/1-44/3, 45/39/1 - 45/39/3, 46/39/1 - 46/39/3, 47/1-47/3, 48/39/1-48/39/3, 49/39/1-49/39/3, and 52/39/1-52/39/3.

Claims objected to are 6/1-6/3, 7/1-7/3, 14/1-14/3, 15-1-15/3, 16/1-16/3, 17/1-17/3, 42/39/1-42/39/3, 50/39/1-50/39/3, and 51/39/1-51/39/3.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

2. Claims 39/1 - 39/3, 42/39/1 - 42/39/3, and 43/39/1 - 43/39/3 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. In fact, the claims are even broader than their corresponding independent claims. Independent claims 1-3 are amended such that the laminar-to-turbulent boundary layer transition control feature is positioned at the low-pressure side surface of the respective fan blades, while claim 39 recites the limitation of the laminar-to-turbulent boundary layer transition control feature being positioned on at least one of the two side surfaces. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 3745

4. Claims 1-3, 4/1-4/3, 5/1-5/3, 8/1-8/3, 9/1-9/3, 10/1-10/3, 11/1-11/3, 12/1-12/3, 13/1-13/3, 39/1-39/3, 40/39/1-40/39/3, 41/39/1-41/39/3, 43/39/1-43/39/3, 44/39/1-44/39/3, and 52/39/1-52/39/3 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuethe et al. (3,578,264).

Kuethe inherently discloses a method comprising including on a flying aircraft, an aircraft-powering turbofan assembly (Figs. 1-14; col. 1, lines 59-71; col. 2, lines 53-56) comprising multiple fan blades (Fig. 13) mounted on a fan disc and each of the fan blades having a leading edge, a trailing edge, and two side surfaces that comprise a high-pressure side surface and a low-pressure side surface, the turbofan assembly inherently being configured such that a laminar-to-turbulent boundary layer transition occurs on the low-pressure side surface of each of the fan blades during flight, and wherein a plurality of the fan blades are each adapted to further comprise a laminar-to-turbulent boundary layer transition control feature 115 (Fig. 13) at the low-pressure side surface of the respective fan blade, each of the control features initiating and positionally stabilizing a laminar-to-turbulent boundary layer transition to a location upon the respective fan blade between the control feature and the respective fan blades' trailing edge (col. 1, lines 59-66); and wherein an aggregate limited stress occurring in the turbofan assembly at a mounting of the respective fan blade to the fan disc is inherently composed at least partially by fluctuating stresses;

wherein the blade is inherently operates in non-stall conditions;

wherein the laminar-to-turbulent boundary layer transition control features 115 is located on the low-pressure side surface and having an essentially smooth surface portion located between the leading and trailing edges and the feature comprising a surface deviation constituting a departure from the essentially smooth surface portion (Fig. 13);

Art Unit: 3745

wherein the departure from the essentially smooth surface portion is constituted by a reduced-elevation surficial portion, compared to the essentially smooth surface portion (Fig. 9);

wherein the departure from the essentially smooth surface portion is constituted by a raised-elevation surficial portion, compared to the essentially smooth surface portion (Figs. 6-9);

wherein the departure from the essentially smooth surface portion is an elongate strip-shaped area of raised elevation spanning the entire length of the blade (continuous zigzag arrangement 62; col. 5, lines 63-64; Fig. 6), and positioned chordwise between the fan blade leading edge and the fan blade trailing edge.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 47/39/1-47/39/3, 48/39/1-48/39/3, and 49/39/1-49/39/3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuethe.

Kuethe discloses all the limitations except the departure from the essentially smooth surface portion is not about one-tenth of an inch wide as claimed.

Since the applicant has not disclosed that having the departure from the essentially smooth surface portion being about one-tenth of an inch wide solves any stated problem or is for any particular purpose above the fact that the departure from the essentially smooth surface portion affects the boundary layer of the airfoil, and it appears that the method of Kuethe would

Art Unit: 3745

perform equally well with the dimension as defined and claimed by applicant, it would have been an obvious matter of design choice to modify the method of Kuethe by utilizing the specific dimension as claimed.

7. Claims 45/39/1 - 45/39/3, and 46/39/1 - 46/39/3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuethe.

Kuethe discloses all the limitations except the departure from the essentially smooth surface portion is not greater than three inches long as claimed.

Since the applicant has not disclosed that having the departure from the essentially smooth surface portion being greater than three inches long solves any stated problem or is for any particular purpose above the fact that the departure from the essentially smooth surface portion affects the boundary layer of the airfoil, and it appears that the method of Kuethe would perform equally well with the dimension as defined and claimed by applicant, it would have been an obvious matter of design choice to modify the method of Kuethe by utilizing the specific dimension as claimed.

***Allowable Subject Matter***

8. Claims 53-70, due to the method step of determining a range of translation of an unstable transition point between a laminar and a turbulent boundary layer on one of the first side and the second side of at least one of the plurality of unmodified fan blades, are allowed.

9. Claims 6/1-6/3, 7/1-7/3, 14/1-14/3, 15-1-15/3, 16/1-16/3, 17/1-17/3, 42/39/1-42/39/3, 50/39/1-50/39/3, and 51/39/1-51/39/3 are objected to as being dependent upon a rejected base

Art Unit: 3745

claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Information Disclosure Statement***

The US pending application serial numbers 10/817,739 and 10/870,437 have been added to the "OTHER" section of the form PTO-1449 dated 09 August 2006 and considered.

***Conclusion***

10. Applicant's amendment, introducing the limitation of the laminar-to-turbulent boundary layer transition control feature locating at the low-pressure side surface of the respective fan blades, necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

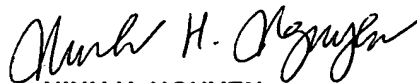


Art Unit: 3745

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Ninh Nguyen whose telephone number is (571) 272-4823. The examiner can be normally reached on Monday-Friday from 7:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look, can be reached at (571) 272-4820. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, please go to <http://pair-direct.uspto.gov> or contact the Electronic Business center (EBC) at 866-217-9197 (toll-free).

  
NINH H. NGUYEN  
PRIMARY EXAMINER

Nhn  
October 18, 2006